

1. A transducer comprising:

a bobbin having a first end and a second end formed of a conductive loaded resin-based material, wherein said conductive loaded resin-based material comprises micron conductor fibers, micron conductor powders, or a combination of said micron conductor fibers and said micron conductor powders homogenized within a base resin host;

a conducting wire having a preferred diameter, a first end, a second end, and an insulating coating formed thereon wound around said bobbin thereby forming a number of turns of said conducting wire wound around said bobbin formed of conductive loaded resin-based material;

a first support member attached to said first end of said bobbin wherein said first support member is formed of said conductive loaded resin-based material;

a second support member attached to said second end of said bobbin wherein said second support member is formed of said conductive loaded resin-based material;

electrical connections to said first end and said second end of said conducting wire; and

electrical connections to said first support member and said second support member.

2. The transducer of claim 1 wherein the ratio of the weight of said micron conductor fibers, said micron conductor powders, or said combination of said micron conductor fibers and said micron conductor powders to the weight of said base resin host is between about 0.20 and 0.40.

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3. The transducer of claim 1 wherein said micron conductor fibers have diameters of between about 3 and 12 microns.

4. The transducer of claim 1 wherein said micron conductor fibers have diameters of
10 between about 8 and 12 microns.

5. The transducer of claim 1 wherein said micron conductor fibers have lengths of between about 2 and 14 millimeters.

15 6. The transducer of claim 1 wherein said micron conductor powders are made up of micron conductor particles having a generally spherical shape with diameters of between about 3 and 12 microns.

7. The transducer of claim 1 wherein said micron conductor fibers are stainless steel,
20 nickel, copper, silver, carbon, graphite, or plated fibers.

8. The transducer of claim 1 wherein said micron conductor powders comprise micron conductor stainless steel, nickel, copper, silver, carbon, graphite, or plated particles.

9. The transducer of claim 1 wherein said bobbin has a rectangular cross section.

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10. The transducer of claim 1 wherein said first support member and said second support member have a rectangular cross section.

10 11. The transducer of claim 1 wherein the dimensions of said bobbin, the dimensions of said first and second support members, said diameter of said conducting wire, the winding density of said number of turns of said conducting wire, and said number of turns of said conducting wire are chosen so that said transducer has a center frequency of maximum coupling between about 137 megahertz and 152 megahertz.

15 12. The transducer of claim 1 wherein the dimensions of said bobbin, the dimensions of said first and second support members, said diameter of said conducting wire, the winding density of said number of turns of said conducting wire, and said number of turns of said conducting wire are chosen so that said transducer has a center frequency of maximum coupling between about 2 kilohertz and 300 gigahertz.

13. The transducer of claim 1 wherein said first end and said second end of said conducting wire are connected to a circuit or device utilizing electromagnetic energy and said first support member and said second support member are connected to an antenna.

5 14. The transducer of claim 1 wherein said first end and said second end of said conducting wire are connected to a circuit or device utilizing electromagnetic energy and said first support member, said second support member, and said bobbin form an antenna.

15 A method of forming a transducer comprising:

10 forming a bobbin having a first end and a second end of a conductive loaded resin-based material, wherein said conductive loaded resin-based material comprises micron conductor fibers, micron conductor powders, or a combination of said micron conductor fibers and said micron conductor powders homogenized within a base resin host;

15 winding a conducting wire having a preferred diameter, a first end, a second end, and an insulating coating formed thereon around said bobbin thereby forming a number of turns of said conducting wire wound around said bobbin formed of conductive loaded resin-based material;

forming a first support member and a second support member of said conductor loaded resin-based material;

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attaching said first support member to said first end of said bobbin and said second support member to said second end of said bobbin, or forming said first support

member, said second support member, and said bobbin as one unit with said first end of said bobbin attached to said first support member and said second end of said bobbin attached to said second support member;

forming electrical connections to said first end and said second end of said
5 conducting wire; and

forming electrical connections to said first support member and said second support member.

16. The method of claim 15 wherein the ratio of the weight of said micron conductor
10 fibers, said micron conductor powders, or said combination of said micron conductor fibers and said micron conductor powders to the weight of said base resin host is between about 0.20 and 0.40.

17. The method of claim 15 wherein said forming a bobbin and said forming a first
15 support member and a second support member and/or said forming said first support member, said second support member, and said bobbin as one unit are accomplished using molding techniques of said conductor loaded resin-based material.

18. The method of claim 15 wherein said forming a bobbin and said forming a first
20 support member and a second support member and/or said forming said first support member, said second support member, and said bobbin as one unit are accomplished using thermo-set methods of said conductor loaded resin-based material.

19. The method of claim 15 wherein said forming a bobbin and said forming a first support member and a second support member and/or said forming said first support member, said second support member, and said bobbin as one unit are accomplished using compression of said conductor loaded resin-based material.

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20. The method of claim 15 wherein said micron conductor fibers have diameters of between about 3 and 12 microns.

21. The method of claim 15 wherein said micron conductor fibers have diameters of
10 between about 8 and 12 microns.

22. The method of claim 15 wherein said micron conductor fibers have lengths of between about 2 and 14 millimeters.

15 23. The method of claim 15 wherein said micron conductor powders are made up of micron conductor particles having a generally spherical shape with diameters of between about 3 and 12 microns.

24. The method of claim 15 wherein said micron conductor fibers are stainless steel,
20 nickel, copper, silver, carbon, graphite, or plated fibers.

25. The method of claim 15 wherein said micron conductor powders comprise micron conductor stainless steel, nickel, copper, silver, carbon, graphite, or plated particles.

26. The method of claim 15 wherein said bobbin has a rectangular cross section.

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27. The method of claim 15 wherein said first support member and said second support member have a rectangular cross section.

28. The method of claim 15 wherein the dimensions of said bobbin, the dimensions of
10 said first and second support members, said diameter of said conducting wire, the winding density of said number of turns of said conducting wire, and said number of turns of said conducting wire are chosen so that said transducer has a center frequency of maximum coupling between about 137 megahertz and 152 megahertz.

15 29. The method of claim 15 wherein the dimensions of said bobbin, the dimensions of said first and second support members, said diameter of said conducting wire, the winding density of said number of turns of said conducting wire, and said number of turns of said conducting wire are chosen so that said transducer has a center frequency of maximum coupling between about 2 kilohertz and 300 gigahertz.

30. The method of claim 15 wherein said first end and said second end of said conducting wire are connected to a circuit or device utilizing electromagnetic energy and said first support member and said second support member are connected to an antenna or electronic device.

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31. The method of claim 15 wherein said first end and said second end of said conducting wire are connected to a circuit or device utilizing electromagnetic energy and said first support member, said second support member, and said bobbin form an antenna.